

## REMARKS

In Item 2 of the Final Office Action mailed on May 4, 2006, the specification was objected to due to a typographical error. The specification is amended herewith to correct the error.

In Item 5 of the Office Action, claims 1, 4, 6-9, 11, 12, 15, 18-20, 22-24, 26-28, 30, 32, 35, 37, 38, 40, 42, 44, 46, 48-50, 52-55, 57, 59, 61, 63, 65, 68, 70, 71, 73, 75 and 77-80 were rejected under 35 U.S.C. 103(a) as being unpatentable over Ling et al (International Application WO 98/39871) in view of any/all of Ungerboeck ("Channel Coding with Multilevel/phase Signals"), Lee (*Convolutional Coding: Fundamentals and Applications*), and Schlegl (*Trellis Decoding*), and further in view of Uyematsu et al. ("Trellis Coded Modulation for Multilevel Photon Communication Systems"). Regarding claim 1, the Examiner goes to great lengths to argue that Ling, when read in the light of the Ungerboeck, Lee and Schlegl references, appears to teach a trellis coded modulation (TCM) scheme. The Examiner then goes on to argue that it would have been obvious to a person of ordinary skill in the art to apply the alleged trellis coding method of Ling to an *optical* system to transmit the analog multilevel signals over an *optical* channel. Even assuming, for the sake of argument, that Ling teaches a trellis coded modulation scheme, and further assuming, for the sake of argument, that it would have been obvious to a person of ordinary skill in the art to apply the alleged trellis coding method of Ling to an *optical* system to transmit the analog multilevel signals over an *optical* channel, it does not follow that it would have been obvious to apply Ling's equalization on the transmit side to an optical communication system. Thus Applicant submits that the cited combination of Ling, Ungerboeck/Lee/Schlegl, and Uyematsu does not teach nor suggest "equalizing the digital multilevel symbols to compensate for characteristics of (an) optical channel," as claimed in claim 1. Indeed, the Examiner does not directly assert that it would have been obvious to apply Ling's equalization on the transmit side to an optical communication system, but rather only asserts that it would have been obvious to apply Ling's alleged TCM scheme to an optical communication system. Furthermore, the Examiner does not provide any motivation to apply Ling's equalization on the transmit side to an optical communication system. Applicant submits that there is no suggestion to combine the equalization on the transmit side of Ling with Uyematsu's trellis coding for optical systems. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in

light of the teachings of the references.”<sup>1</sup> Applicant submits that there is no suggestion in either Ling or Uyematsu (nor in Ungerboeck, Lee or Schlegl) to apply Ling’s equalization on the transmit side to an optical system. Therefore, Applicant submits that claim 1, and claims 4-9 depending therefrom, are not obvious in view of Ling, Ungerboeck/Lee/Schlegl and Uyematsu.

Independent claims 11, 28, 32, 38, 42, 57, 61, 65 and 71 contain limitations similar to limitations included in claim 1 and was rejected under similar reasoning to the rejection of claim 1. Applicant submits that claims 11, 28, 32, 38, 42, 57, 61, 65 and 71, and all claims depending therefrom, are not obvious in view of Ling, Ungerboeck/Lee/Schlegl and Uyematsu, for the reasons set for the above with respect to claim 1.

Independent claims 24, 46, 50 and 75 were also rejected under 35 U.S.C. 103(a) as being unpatentable over Ling in view of any/all of Ungerboeck, Lee and Schlegl, and further in view of Uyematsu. Claims 24, 46, 50 and 75 involve performing equalization at the receive end of an optical communication system that utilizes multilevel signals and/or trellis coded signals. The Examiner went into little detail regarding the rejection of these claims, other than to assert that the combination of Ling, Ungerboeck/Lee/Schlegl and Uyematsu teaches the claims. Applicant assumes that in rejecting these claims, the Examiner employed a similar rationale as that used in rejecting claim 1. In any event, Applicant submits that it would not have been obvious for one of ordinary skill in the art to apply Ling’s equalization on the receive side to an optical communication system that utilizes multilevel signals and/or trellis coded signals. Thus Applicant submits that the cited combination of Ling, Ungerboeck/Lee/Schlegl, and Uyematsu does not teach nor suggest performing equalization at the receive end of an optical communication system that utilizes multilevel signals and/or trellis coded signals, as claimed in claims 24, 46, 50 and 75. Indeed, the Examiner does not directly assert that it would have been obvious to apply Ling’s equalization on the receive side to an optical communication system. Furthermore, the Examiner does not provide any motivation to apply Ling’s equalization on the receive side to an optical communication system. Applicant submits that there is no suggestion to combine the equalization on the receive side of Ling with Uyematsu’s trellis coding for optical systems. “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of

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<sup>1</sup> *Ex Parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.”<sup>2</sup> Applicant submits that there is no suggestion in either Ling or Uyematsu (nor in Ungerboeck, Lee or Schlegl) to apply Ling’s equalization on the receive side to an optical system. Therefore, Applicant submits that claims 24, 46, 50 and 75, and all claims depending therefrom, are not obvious in view of Ling, Ungerboeck/Lee/Schlegl and Uyematsu.

Applicant made the above arguments in the Amendment filed on January 18, 2006. The Examiner rebutted said arguments in Item 7 of the Office Action dated May 4, 2006. The Examiner’s rebuttal is as follows: “In particular, notice that Ling *already* teaches the application of equalization on the transmit side of a communication system. In view of Uyematsu, it would have been obvious to apply the system of Ling to an *optical* communication system (in particular, an *optical* channel). Accordingly, the ensuing combination would *already* include the application of equalization of Ling on the transmit side of a communication system.” This is a circular argument. The statement, “In view of Uyematsu, it would have been obvious to apply the system of Ling to an *optical* communication system,” is a conclusory statement for which the Examiner fails to provide any support. Ling does not disclose applying equalization on the transmit side of an optical system. The only mention of medium in Ling refers to copper (p. 4, lines 27-29). Uyematsu discloses performing trellis coding in an optical system, but says nothing about performing equalization in an optical system. Therefore, the Examiner must provide a suggestion in the prior art of applying equalization on the transmit side to an optical system. The Examiner fails to do so, but then goes on to argue that “the ensuing combination (of Uyematsu and Ling) would *already include* the application of equalization of Ling on the transmit side of a communication system.” Applicant submits that because the Examiner cannot find any art teaching the application of equalization on the transmit side of an optical system, nor find any suggestion for doing so, the Examiner is attempting to dispense with the requirement for showing motivation to combine references. A similar line of argument applies for the application of Ling’s equalization on the receive side of an optical communication system.

In view of the foregoing, Applicant respectfully requests reconsideration and allowance of claims 1, 4-9, 11, 12, 15, 16, 18-20, 22-24, 26-28, 30-32, 35-38, 40-42, 44-46, 48-50, 52-55,

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<sup>2</sup> *Ex Parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

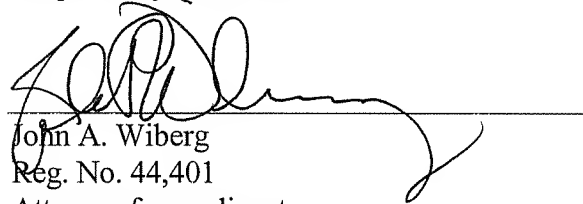
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Reply to Office action of May 4, 2006

57, 59-61, 63-65, 68-71, 73-75 and 77-80. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Account No. 13-0017.

Date: July 5, 2006

Respectfully submitted,



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